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lentus is said to have a squamulose pileus and a thin and short stipe. This description is not applicable to my specimens. Twelve sporophores in different stages of development were collected and none of them appear squamulose. The pileus of an old weathered specimen of *P. lentus* may become smooth just as we find it to be the case in old specimens of *P. polyporus* and *P. arcularius*. All my specimens both old and young have a smooth pileus.

The following table may aid in distinguishing these related species:

Tubes regular or nearly so,	I.
Tubes irregular or hexagonal,	2.
1. Pileus villose, usually dark colored,	<i>P. polyporus</i> .
1. Pileus glabrous, ochraceous, stipe black at base,	<i>P. elegans</i> .
2. Pileus squamulose, grayish fuscous, pores large,	<i>P. arcularius</i> .
2. Pileus squamulose, ochraceous-pallid, pores large,	<i>P. lentus</i> .
2. Pileus glabrous or nearly so, tan-colored or isabelline, pores smaller,	<i>P. pennsylvanicus</i> .

Dr. W. A. Murrill kindly compared some of my specimens with material in the Herbarium of the New York Botanical Garden.

Wilkinsburg, Pa.

A STUDY OF THE LEAF-TIP BLIGHT OF DRACÆNA FRAGRANS.

JOHN L. SHELDON.

Last winter, several diseased plants of *Dracaena fragrans* were noticed in the greenhouses of the West Virginia Experiment Station. Most of the lower leaves were dead and the middle ones were dead at the tips. There were small black specks scattered through the dead portions of the leaves, for the most part on the upper side. A microscopical examination showed that the leaves had probably been killed by a species of *Gloeosporium*.

After consulting the pathological literature in the station library, I decided that Dr. Halsted¹ had found the same disease some years before and had called it a "leaf-tip blight." He says in his description of it, "The fungus which was destroying the

¹ Halsted, B. D. Leaf-tip blight of *Dracaena fragrans*. Rept. N. J. Agr. Exp. Sta. 14:413. 1893.

leaf inch by inch is a species of anthracnose of the genus *Gloeosporium*.²

Several anthracnoses were being studied when this one on the dracæna was found. Pure cultures of it were obtained for comparison with the others. Conidia began to develop in the cultures when they were only a day old. These conidia were borne on the ends of hyphae from the sides of the filaments of the radiating mycelium. A little later, acervuli began to appear in the cultures, the mature conidia collecting in little pinkish masses on the surface of the culture medium.

Developing along with, and for some time after, the acervuli, were small black bodies resembling young acervuli; these bodies proved to be perithecia, containing long, slender paraphyses and club-shaped ascii with hyaline, single-celled spores. In size and general appearance, the conidia and ascospores were alike except that most of the ascospores were slightly curved. The perithecia varied from spherical to flask-shaped and long-rostrate, the long-rostrate forms being for the most part deeper in the culture medium. There was a tendency to produce only the perithecial stage after the fungus had been grown for several generations on artificial media.

After perithecia were obtained in the cultures, the leaves were examined and patches of perithecia were found on them. Pure cultures were then obtained from some of these perithecia, and both conidial and perithecial stages developed from the ascospores, proving that the acervuli and perithecia on the leaves were stages of the same fungus.

Inoculation experiments were now begun by inoculating pieces of sterilized bean stems with conidia from the pure cultures. In a few days acervuli began to show on the bean stems, and later, perithecia. These perithecia were superficial, somewhat hairy and flask-shaped, while those on the dracæna leaves were sub-epidermal and sub-spherical.

Three plants of *Dracaena fragrans* were placed side by side in the greenhouse. After waiting several weeks to see whether they had the same disease, two of them were inoculated with conidia from a pure culture. Several of the leaves were killed back from the tips from one to three inches and one had a spot on it. Acervuli developed in all the dead areas and perithecia in one. The fungus was transferred from the inoculated plants to the third by spraying them with a hose. The fungus spread very rapidly on the infected leaves when they were removed and placed in a moist chamber, acervuli and perithecia developing in abundance.

I am in doubt about the taxonomy of this fungus. Dr. Halsted² called it a species of *Gloeosporium*, and so it seems to

² l. c.

be in one of its conidial stages, but where does its perithecial stage belong? Species of *Gloeosporium*, and their near kin, the *Colletotrichums*, are so common that it does seem as if some one must have found the perithecial stage of a few of them and described them as species of long-established genera. This might have been done without a knowledge of the acervial stage. There are a few records of species of *Laestadia*, *Physalospora*, and the comparatively new genus *Glomerella* with known conidial stages of species of *Gloeosporium* and *Colletotrichum*; there is also a considerable number of hosts which have species of *Gloeosporium* and *Colletotrichum* (one or both) and species of *Laestadia* and *Physalospora* (one or both) occurring upon them, but whether any relationship exists between these acervial and perithecial stages is probably unknown.

This fungus, which causes the leaf-tip blight of *Dracaena fragrans*, is very similar to species of *Laestadia*, *Physalospora*, and *Glomerella* having both acervial and perithecial stages, especially *P. Vanillae* A. Zimmerm., *P. Cattleyae* Maubl. & Lasnier, and the apparently composite species *Glomerella rufomaculans* (Berk.) Sp. & v. Schr. If the presence of paraphyses is taken into consideration, it cannot be a species of *Laestadia*, since this genus is not paraphysate; neither can it be a species of *Glomerella*, as this genus was originally described,³ for the perithecia in the leaves and many of the cultures are simple instead of "caespitose or more or less compound and immersed in a stroma" and paraphysate instead of "aparaphysate." Since it corresponds more nearly to the genus *Physalospora* than to either *Laestadia* or *Glomerella*, it is placed in this genus for the present and the name *Physalospora Dracaenae* n. sp. proposed.

West Virginia Experiment Station,
Morgantown, W. Va., June 10, 1907.

³ Schrenk, Hermann von and Spaulding, Perley. The bitter-rot of apples. Bul. U. S. Dept. Agr. Bu. Pl. Ind. 44:29. 1903.